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MAPPING OF NORTHERN GHANA FROM AERIAL PHOTOGRAPHS

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MAPPING OF NORTHERN GHANA FROM AERIAL PHOTOGRAPHS

Serial No.100 Sub Item A.1

by

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1. One of the problems to be overcome in the development of Northern Ghana is the lack of adequate maps. Up to the early fifties the only maps covering some 40,000 square miles of the territory of Northern Ghana were the results of rapid military surveys at the comparatively small scales of 1/125,000 and 1/250,000 which are not only too small and inaccurate but also quite out of date for development purposes. The first attempt to improve upon the map coverage of these areas was made in 1948-50 when the Royal Air Force produced the first aerial photographs of the area.

2. As a result of the War, little had then been done in the training of surveyors and draughtsmen and several devices had to be found to overcome difficulties in the way of producing maps from aerial photographs in Ghana for the first time with the limited resources available.

3. The Directorate of Overseas Surveys very kindly loaned the Department the services of one experienced aerial survey draughtsman. First a number of hand stereoscopes and some 12" steel straight edges were procured and a 25'x25'x4" plotting board constructed by a local carpenter. The board was then sprayed with white celulose enamel and grided at the scale of 1/30,000. A machine for slotting templates and some 11"x11" sheets of acetate were next added to the equipment. Training then began with some 10 draughtsmen. In a few weeks good standards had been acquired in base-lining, template cutting and photo interpretation.

4. The next big problem was ground control. Apart from this being sparse, no surveyors could be spared to identify control in the field or provide extension to the existing controls. Pillars of the existing control traverses followed roads but were placed several feet back in the featureless bush. Such pillars could hot be identified on photographs from mere descriptions, as is often possible in the case of trigonometrical points. As controls had to be provided without recourse to field work, the following procedure was adopted for establishing a control system for both photography and master grid :-

(a) Selected co-ordinated traverse pillars were plotted on the master grid from co-ordinates.

(b) Strips of transparent plastic were placed over these points on the master grid and the positions transferred to the plastic.

(c) The plastic strips were then removed from the master grid and the traverse was then plotted between each pillar.

(d) Traversed points which could be easily identified on the photographs were marked-up and given a number.

(e) The plastic strips were then returned to the master grid, and the selected points on the plastic were pricked through to the master grid.

5. Thus with these traversed but un-co-ordinated points accurately plotted on the master grid by graphical methods, it was possible to identify these points readily on the photographs.

6. It was impossible to lay the templates according to the sheets system. Templates were laid in areas where the control was fairly plentiful. Often huge areas of templates had to be fitted to edge points arrived at from earlier lay-downs, there being no control points what-soever to work to.

7. Great care had to be taken to ensure that templates 'fell' into position without the use of the slightest degree of force. It was not expected that the accuracy of the templates assemblies would be of a standard equal to the inherent errors in the slotted template method i.e. the arithmetic mean error of points fixed by radial intersection from a template assembly. None-the-less it was expected that any inaccuracies would not be greater than would normally be tolerated on a 1/50,000 map.

8. To date, some 30,000 square miles of territory has been compiled at a scale of 1/30,000. These compilations will be photographically reduced to 1/50,000 and fair drawn at that scale for publication. Contouring is to be done by photogrammetric methods in the United Kingdom. Meanwhile, demands for planning maps in limited areas for development needs are met by using these planimetric compilations as a base for contouring by plane table methods. It has been found possible with the aid of aerial photographs and field stereoscopes to produce adequate contoured maps by these methods in about one-third the time taken to produce them by the conventional plane table methods.

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